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USING THE GALILEO SPACECRAFT TO FIND PEAK ELECTRON DENSITIES IN JUPITER'S MAGNETOSPHERE

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The Galileo spacecraft orbited Jupiter and made measurements inside its magnetosphere. We compared data from the plasma wave instrument and the magnetometer onboard the spacecraft with a model of Jupiter's magnetosphere. We also compared the peak electron density in the data to where the peak density was predicted by the model. We found that the model agreed well with the density data within sixty Jupiter radii of the planet. There was less agreement between the data and the model beyond sixty Jupiter radii. The differences between the data and the model far from Jupiter showed no systematic patterns. A better understanding of the dynamics in the outer magnetosphere would help improve the model there. The magnetometer data and the density data also agreed best at distances less than sixty Jupiter radii from the planet. The magnetic field essentially defines where the plasma sheet is located. Because we found good agreement between the magnetometer data and the density data, we concluded that the density peak was also a good indicator of the center of the plasma sheet.